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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GANG LUO, MICHAEL W. WATZKE, and CURT J. ELLMANN

Appeal 2009-005287
Application 10/694,564
Technology Center 2100

Decided: February 22, 2010

Before LEE E. BARRETT, JEAN R. HOMERE, and STEPHEN C. SIU
Administrative Patent Judges.

SIU, *Administrative Patent Judge.*

DECISION ON APPEAL
STATEMENT OF THE CASE

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-12, 14-20, 22-26, and 28-30. Claims 13, 21, and 27 are canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

Invention

The invention relates to a method and apparatus that identifies statements in a transaction that specify the modification of commutative and associative operations (Spec. 2, ¶ [0004]). The identified statements are combined into one statement, which is submitted to the database system (*id.*).

Independent claims 1 and 14 are illustrative:

1. A method comprising:

- establishing multiple sessions with a database system, each session associated with at least one transaction;
- identifying transactions that operate on the same set of one or more tuples;
- re-allocating transactions between or among the sessions such that the identified transactions that operate on the same set of one or more tuples are allocated to one of the sessions;
- identifying statements in a particular one of the transactions that specify modification operations that are commutative and associative;
- combining the identified statements into one statement; and
- submitting the one statement to the database system.

14. An article comprising at least one storage medium containing instructions that when executed cause a controller to:

identify statements in a first transaction that specify modification operations on values b_1 through b_m , m greater than 1, that are, commutative and associative, each of the modification operations-applied on a set of one or more tuples;

combine the identified statements into one statement that specifies a modification operation on a value c that is an aggregation of b_1 through b_m , the aggregation being one of addition and multiplication; and

submit the one statement to a database system.

References

The Examiner relies upon the following references as evidence in support of the rejection:

Avadhanam	US 6,714,938 B1	Mar. 30, 2004 (Filed Aug. 31, 2002)
Gu	US 6,829,600 B2	Dec. 7, 2004 (Filed Apr. 3, 2003)

Bernd Walter, *Nested Transactions with Multiple Commit Points: An Approach to the Structuring of Advanced Database Applications*, Proceedings of the Tenth International Conference on Very Large Data Bases, pp. 161-171, Singapore (Aug. 1994) (“Walter”).

MathLeague, *Introduction to Algebra* (Mar. 2001) (“MathLeague”).

Gisele Glosser, *Lessons on Order of Operations with Exponents* (Aug. 2000) (“Glosser”).

Rejections

Claims 1-4, 10-12, 14-17, 22-26, and 28-30 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gu, Walter, and MathLeague.

Claims 5-7, 18, and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gu, Walter, MathLeague, and Avadhanam.

Claims 8, 9, and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gu, Walter, MathLeague, and Glosser.

ISSUE 1

The Examiner concludes that “‘re-allocating transactions between or among . . . sessions’ is seen as combining the sequences of transactions into a single atomic statement Since the equivalence in the equation must be upheld, transactions in Walter[] and MathLeague must be moved like in Gu so they can be committed in a single atomic statement” (Ans. 17).

Appellants argue that “[c]ombining the commands of Gu refer to combining SQL statements—there is no suggestion of *re-allocating* transactions between or among sessions” (App. Br. 7). Appellants also submit that “[c]omitting transactions in different spheres atomically together, as disclosed by Walter, is completely unrelated to *re-allocating* transactions between or among the *sessions* . . .” (Reply Br. 4).

Issue: Did Appellants demonstrate that the Examiner erred in finding that the combination of the Gu, Walter, and MathLeague references would have taught or suggested re-allocating transactions between or among sessions?

ISSUE 2

The Examiner finds that Gu, Walter, and MathLeague would have taught or suggested combining statements $\langle t, b_i \rangle$ through $\langle t, b_m \rangle$, m being greater than 1, where t represents a set of one or more tuples, and b_1 through b_m represent respective modification operations on the set of one or more tuples, into statement $\langle t, c \rangle$ where c represents an aggregation of b_1 through b_m (Ans. 6-7).

Appellants submit that “[t]he combining of conditional INSERT and UPDATE statements into a MERGE statement as taught by Gu is completely different from the combining specified in claim 14” (App. Br. 10).

Issue: Did Appellants demonstrate that the Examiner erred in finding that the combination of the Gu, Walter, and MathLeague references would have taught or suggested the claimed identification and combination of statements that specify commutative and associative modification operations?

FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

1. Gu teaches:

the SQL [Structured Query Language] statement MERGE, which combines the sequence of conditional INSERT and UPDATE commands in a single atomic statement to merge data from a

source to a destination or target The INSERT and UPDATE commands are considered conditional in that (a) if a record in the new data corresponds to an item that already exists in the destination, then an UPDATE operation is performed on the item; and (b) if a record in the new data does not already exist in the destination, then an INSERT operation is performed to add a corresponding record to the destination.

(Col. 1, ll. 32-42).

2. Walter teaches committing nested transactions where “all transactions belonging to the same commit sphere commit atomically together. The commitment of an inner sphere can be done earlier than the commitment of an outer sphere, the commitment of an outer sphere implies the commitment of its inner spheres (if not already done)” (p. 168). When this happens “[t]he coordinator of the commitment writes a commit record into stable storage and then issues a commit command for all transactions in the sphere to be committed” (*id.*).

3. MathLeague teaches solving for x in the equation $x \div 12 = 5$ by multiplying both sides of the equation by 12 (p. 7).

PRINCIPLES OF LAW

Claim interpretation

“In the patentability context, claims are to be given their broadest reasonable interpretations. . . . [L]imitations are not to be read into the

claims from the specification.” *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (citations omitted).

Obviousness

The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, and (3) the level of skill in the art. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966).

ANALYSIS

Issue 1

Appellants dispute the Examiner’s finding that the combination of the Gu, Walter, and MathLeague references would have taught or suggested re-allocating transactions between or among sessions. Independent claims 1 and 22 both include this limitation.

The Examiner finds that Gu teaches combining a sequence of transactions into a single statement (Ans. 17) and that Walter teaches multiple sessions (Ans. 16). The Examiner concludes that combining Gu and Walter would have taught or suggested re-allocating transactions between or among sessions (Ans. 17). We disagree.

Gu teaches a single SQL statement, MERGE, which combines separate conditional INSERT and UPDATE statements into a single atomic statement (FF 1). Walter teaches committing nested transactions, which involves writing a commit record into stable store and issuing a commit

command for all transactions in the sphere to be committed (FF 2). The Examiner reasons that the combination of Gu and Walter would have taught or suggested the claimed re-allocation because “Walter discloses nested transactions with multiple commit points comprising committing child transactions upon committing the parent transaction” (Ans. 5).

Gu’s UPDATE operation is performed when an item *already exists* in the destination, thus modifying data that existed in the destination (FF 1). In contrast, the INSERT operation is performed when an item *does not exist* in the destination, thus adding new data to the destination (*id.*). Because either the UPDATE operation or the INSERT operation is performed, based on whether data to update or insert exists in the destination, it would not have been obvious to an artisan that the two operations could have executed in different sessions. Thus, the combination of Gu and Walter would not have taught or suggested re-allocation of statements between or among sessions. MathLeague’s teaching of how to solve an algebraic equation through multiplication (FF 3) fails to cure this deficiency.

For at least these reasons, we find that Appellants have sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s 35 U.S.C. § 103(a) rejections of claims 1-12, 22-26, and 28-30 with respect to this issue.

Issue 2

Appellants dispute the Examiner’s conclusion that Gu, Walter, and MathLeague would have taught or suggested the identifying and combining steps of claims 10, 14, and 28.

Appellants note “there is initially at least statements $\langle t, b_1 \rangle$ and $\langle t, b_2 \rangle$ ” (App. Br. 9). Gu teaches an omnibus MERGE statement which combines INSERT $\langle t, b_1 \rangle$ and UPDATE $\langle t, b_2 \rangle$ statements (FF 1). Appellants argue that “[t]he combination of these two statements results in $\langle t, c \rangle$, where $c = b_1 + b_2$ ” (App. Br. 9). More precisely, Appellants claim that the combination of statements “represents an aggregation of b_1 through b_m ” (claim 10). Claim 14 specifies “the aggregation being one of addition and multiplication.”

Appellants argue that Gu’s combination of the conditional UPDATE and INSERT statements does not teach “ $c = b_1 + b_2$ ” (App. Br. 9). But the MERGE (c) statement performs both the UPDATES (b_1) and INSERTs (b_2). Thus, MERGE aggregates the operations, adding their effects together. Therefore, we find no error in the Examiner’s reasoning as it applies to these broadly worded limitations.

For at least these reasons, we find that Appellants have not sustained the requisite burden on appeal in providing arguments or evidence persuasive of error in the Examiner’s 35 U.S.C. § 103(a) rejections of claims 10-12, 14-20, and 28-30 with respect to this issue.

CONCLUSIONS OF LAW

Based on the findings of facts and analysis above, we conclude that Appellants have demonstrated that the Examiner erred in finding that the combination of the Gu, Walter, and MathLeague references would have

taught or suggested re-allocating transactions between or among sessions (Issue 1).

However, Appellants have not demonstrated that the Examiner erred in finding that the combination of the Gu, Walter, and MathLeague references would have taught or suggested the claimed identification and combination of statements that specify commutative and associative modification operations (Issue 2).

DECISION

We reverse the Examiner's decision rejecting claims 1-12, 22-26, and 28-30 under 35 U.S.C. § 103(a).

We affirm the Examiner's decision rejecting claims 14-20 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART

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JAMES M. STOVER
TERADATA CORPORATION
2835 MIAMI VILLAGE DRIVE
MIAMISBURG OH 45342